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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,734	12/02/2003	Hideo Kaneko	0171-1045P	2079

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EXAMINER	
ROSASCO, STEPHEN D	

ART UNIT	PAPER NUMBER
1756	

DATE MAILED: 09/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/724,734	KANEKO ET AL.	
	Examiner	Art Unit	
	Stephen Rosasco	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/25/04 12/16/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed Action

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Bozler et al. (4,619,894).

Bozler et al. teach a process for forming a selected pattern on the surface of a substrate, comprising:

(a) forming on said substrate a substantially etchable, low ohmic resistivity cermet layer of aluminum and Al.sub.2 O.sub.3 by depositing aluminum on said substrate in an oxygen environment;

(b) heating selected regions of said cermet layer by exposing such selected regions to radiant energy to selectively transform said exposed regions from said substantially etchable low ohmic resistivity material to substantially less-etchable material higher ohmic resistivity; and

(c) removing the unexposed regions to form a pattern of less etchable higher ohmic resistivity material on said substrate surface.

And in which said source of radiant energy is a source selected from the class consisting of electron beam, laser beam, flash lamps, ion bean and X-ray source.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to

a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (6,806,021) in view of Bozler et al. (4,619,894).

The claimed invention is directed to a method for manufacturing a photomask blank having a film of at least one layer formed on a substrate, comprising the steps of forming a film on a substrate, and irradiating the film with light from a flash lamp.

And wherein the step of forming a film on a substrate includes sputtering.

And wherein the film is a phase shift film which contains silicon, at least one metal other than silicon, and at least one element selected from the group consisting of oxygen, carbon and nitrogen.

The applicant discusses the limitations of the prior art in that phase shift masks are manufactured by lithographically patterning phase shift mask blanks, which involves the step of applying a resist onto a phase shift mask blank, irradiating selected portions of the resist with electron beams or ultraviolet radiation, developing the resist, and etching desired portions of the phase shift film. Thereafter, the resist film is stripped, leaving a phase shift mask.

In a photomask blank like the mask blank discussed above, a film like the phase shift film is generally formed on a substrate by sputtering. Stresses are induced in the film, by which the substrate is distorted. The resulting photomask blank is thus warped. If a photomask is manufactured through patterning of such a photomask blank, the warpage of the substrate is locally resumed to the original state prior to film formation because the film is partially removed by patterning. The resulting substrate has varying degrees of flatness. These changes introduce positional shifts between the mask blank during the pattern exposure and the actually finished mask. Such positional shifts have a larger influence as the mask pattern becomes finer, and the warpage sometimes cause focal shifts.

The claimed invention is directed to providing a method for manufacturing a photomask blank of quality having minimized warpage and improved chemical resistance and a method for manufacturing a photomask therefrom.

The applicant states that they have found that by forming a film on a transparent substrate and irradiating the film with light from a flash lamp, the resulting photomask blank is minimized in warpage and the film is improved in chemical resistance. Preferably the film is formed by sputtering. The film preferably has a lower light transmittance than the substrate. Typically, the film is a phase shift film which contains silicon, at least one metal other than silicon, and at least one element selected from among oxygen, carbon and nitrogen.

Sato et al. teach a multi-layer resist process, i.e. a method wherein a resist pattern is once transcribed to a silicon oxide film to form a silicon oxide film pattern. According to this method, the silicon oxide film pattern thus formed is employed as an etching mask to dry-etch the working film, thus transcribing the pattern to the working film. As for the silicon oxide film to be employed in this case, there has been employed a spin-on glass which can be made into a film at a low cost by a coating method such as spin-coating without necessitating a vacuum system. However, since this spin-on glass is formed into a film by a coating method, it is difficult to obtain a film of high density as compared with the films to be obtained by a physicochemical method such as a CVD method or a sputtering method. Therefore, the film to be formed using the spin-on glass is poor in etching resistance as compared with a silicon oxide film formed by a physicochemical method, so that etch bias is most likely to be generated on the occasion of etching work of the working film.

Sato et al. also teach that a beam of flash lamp was employed as an energy beam and was applied to an intermediate film 104 functioning as a mask after a resist pattern has been formed.

The deformation or denaturing of the resist pattern 206 after the irradiation of the energy beam 207 was not recognized at all. The reason for this can be attributed to the fact that the resist pattern 206 is incapable of absorbing a light in the output wavelength zone of the flash lamp.

The teachings of Sato et al. differ from those of the applicant in that the applicant teaches the steps of forming a film on a substrate, and irradiating the film with light from a flash lamp.

Bozler et al. teach a process for forming a selected pattern on the surface of a substrate, comprising:

(a) forming on said substrate a substantially etchable, low ohmic resistivity cermet layer of aluminum and Al.sub.2 O.sub.3 by depositing aluminum on said substrate in an oxygen environment;

(b) heating selected regions of said cermet layer by exposing such selected regions to radiant energy to selectively transform said exposed regions from said substantially etchable low ohmic resistivity material to substantially less-etchable material higher ohmic resistivity; and

(c) removing the unexposed regions to form a pattern of less etchable higher ohmic resistivity material on said substrate surface.

And in which said source of radiant energy is a source selected from the class consisting of electron beam, laser beam, flash lamps, ion bean and X-ray source.

It would have been obvious to one having ordinary skill in the art to take the teachings of Sato et al. and combine them with the teachings of Bozler et al. in order to make the claimed invention because it would have been obvious to one in the art to use the flash lamp method on the layers of Sato et al. because the aluminum comprising layers taught by Bozler et al. are similar.

Conclusion

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Stephen Rosasco whose telephone number is (571) 272-1389. The Examiner can normally be reached Monday-Friday, from 8:00 AM to 4:30 PM. The Examiner's supervisor, Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S. Rosasco
Primary Examiner
Art Unit 1756

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09/20/05